EPA Region 7 TMDL Review

TMDL ID: KS-MO-05-201-53 **State:** KS
Document Name: WOLF RIVER

Basin(s): MISSOURI
HUC(s): 10240005
Water body(ies): COLD RYAN BRANCH, COON CREEK, HALLING CREEKIN, MIDDLE FORK WOLF RIVER, NORTH FORK WOLF RIVER, RITTENHOUSE BRANCH, SOUTH FORK WOLF RIVER, STRIKER BRANCH, UNNAMED STREAM, WOLF RIVER
Tributary(ies): COLD RYAN BRANCH, COON CREEK, HALLING CREEK, MIDDLE FORK WOLF RIVER, NORTH FORK WOLF RIVER, RITTENHOUSE BRANCH, SOUTH FORK WOLF RIVER, STRIKER BRANCH, UNNAMED STREAM
Pollutant(s): BIOLOGY, SUSPENDED SEDIMENT

Submittal Date: 9/5/2007 **Approved:** Yes

Submittal Letter

State submittal letter indicates final Total Maximum Daily Load(s) (TMDL) for specific pollutant(s)/water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act [40 CFR § 130.7(c)(1)]. Include date submitted letter was received by EPA, date of receipt of any revisions, and the date of original approval if submittal is a phase II TMDL.

Kansas Department of Health and Environment (KDHE) officially submitted this TMDL for approval in a letter received by the United States Environmental Protection Agency (EPA) Region 7 on September 5, 2007. A second version addressing EPA comments was received by email attachment on October 26, 2007.

Water Quality Standards Attainment

The water body's loading capacity (LC) for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards (WQS) [40 CFR § 130.7(c)(1)]. A statement that WQS will be attained is made.

Biologic criteria for Kansas streams are based on the following multi-metric indices: Macroinvertebrate Biotic Index; Kansas Biotic Index; EPT index (ephemeroptera/plecoptera/trichoptera); and % EPT Abundance. The submittal targets are set to result in the attainment of these indices. Wolf River's LC is set by the use of a load duration curve based on the total suspended solids (TSS) concentrations measured at various percentiles of flow in a paired reference stream to address the suspended solids narrative standard. The TSS target is used because of the effect excess sediment deposition has on macroinvertebrates which use coarse substrates. At median flow (50th percentile of flow exceedance) the LC is 1.7 tons of TSS, a reduction of 2.8 tons for that flow.

EPA agrees that meeting the LC should result in the attainment of WQS.

Numeric Target(s)

Submittal describes applicable WQS, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.

The applicable narrative WQS to address the biological indices is for suspended solids:

Suspended solids added to surface waters by artificial sources shall not interfere with the behavior, reproduction, physical habitat or other factor related to the survival and propagation of aquatic or semi-aquatic or terrestrial wildlife. (KAR 28-16-28e(c) (2)(B).

Designated uses for the Wolf River main segments (53,54,56) are: Expected Aquatic Life Support; Primary Contact Recreation; Domestic Water Supply; Food Procurement; Ground Water Recharge; Industrial Water Supply; Irrigation; and Livestock Watering.

The impaired use is Expected Aquatic Life.

The submittal uses the narrative suspended solids standard to address the biological indices used to determine whether the water body is meeting the aquatic life use. The numeric expression of the narrative standard was derived using a paired reference stream approach. The target is the current load duration curve of the reference stream.

flow (cfs)	LC (ton/d)	WLA (ton/d)	LA (ton/d)
15.6	.3	0.1	0.2
21.8	.5	0.1	0.4
24.8	.8	0.1	0.7
32.2	1.2	0.1	1.1
39.6	1.7	0.1	1.6
49.6	3.0	0.1	2.9
64.4	5.3	0.1	5.2
94.2	11.7	0.1	11.6
178.2	45.5	0.1	45.4

Pollutant(s) of concern

An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety (MOS) that do not exceed the LC. If submittal is a phase II TMDL there are refined relationships linking the load to WQS attainment. If there is an increase in the TMDL there is a refined relationship specified to validate the increase in TMDL (either load allocation (LA) or waste load allocation (WLA)). This section will compare and validate the change in targeted load between the versions.

The linkage of the targeted pollutant to the biological impairment is established. To develop this linkage the submittal uses the TSS load for a similar river meeting its aquatic life use. The Chikaskia River is the stream chosen as a reference and its current load duration curve is the target for the Wolf River TMDL. The submittal recognizes that the relationship between biotic indices and TSS is not yet quantified and so the reference approach is used.

EPA agrees that the stated relationship is an appropriate surrogate measure to target for the attainment of the biological indices.

Source Analysis

Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, nonpoint and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered. If this is a phase II TMDL any new sources or removed sources will be specified and explained.

There are three waste water treatment plants (WWTP) located in the watershed at this time (Hiawatha, New South KS0096440; Robinson, KS0047546; and Willis, KS0092037). There are also 14 active livestock waste management operations in the watershed. They are listed in the submittal in Appendix A. Most of the operations are located in the upper two thirds of the watershed and have a combined potential animal units capacity of 7,893. The actual number of animals is typically less than the limit. All of these livestock operations are non-discharging.

Land use in the watershed is predominantly cultivated (72%) followed by forest (12%), tall grass prairie (4%), Conservation Reserve Program areas (4%), and non-native grass (3.5%). Other land uses, such as urban and industrial, account for less than 1% each.

The estimated number of all cattle in the watershed is 27,819.

The upper third of the watershed has an average population density with the lower third being below average. There are an estimated 1,034 septic tank systems in the watershed. These systems are more likely to impact Wolf River during low flow events.

The submittal describes rainfall conditions which generate runoff events and the magnitude of those events. Runoff events result in erosion within the watershed and within the stream itself.

Background conditions identified in the submittal are natural erosive processes and natural streambed and bank erosion.

EPA agrees that the submittal has identified all significant sources of TSS in the watershed.

Allocation - Loading Capacity

Submittal identifies appropriate WLA for point, and load allocations for nonpoint sources. If no point sources are present the WLA is stated as zero. If no nonpoint sources are present, the LA is stated as zero [40 CFR § 130.2 (i)]. If this is a phase II TMDL the change in LC will be documented in this section.

The submittal identifies the present load condition across seasons in Chikaskia River as the TMDL for the Wolf River. An interim goal of the TMDL is to maintain TSS at a concentration that will fully support the aquatic life use in the Wolf River.

WLA Comment

Submittal lists individual WLAs for each identified point source [40 CFR § 130.2(h)]. If a WLA is not assigned it must be shown that the discharge does not cause or contribute to WQS excursions, the source is contained in a general permit addressed by the TMDL, or extenuating circumstances exist which prevent assignment of individual WLAs. Any such exceptions must be explained to a satisfactory degree. If a WLA of zero is assigned to any facility it must be stated as such [40 CFR § 130.2(i)]. If this is a phase II TMDL any differences in phase I and phase II WLAs will be documented in this section.

The WLA is set at current conditions for the three discharging facilities in the watershed. The permits are expressed as monthly averages in the permit and as daily loads in the TMDL (appendix A).

Hiawatha, new south	- KS0096440	0.106 tons/day
Robinson	- KS0047546	0.024 tons/day
Willis	- KS0092037	0.003 tons/day

LA Comment

Includes all nonpoint sources loads, natural background, and potential for future growth. If no nonpoint sources are identified the LA must be given as zero [40 CFR § 130.2(g)]. If this is a phase II TMDL any differences in phase I and phase II LAs will be documented in this section.

The LA is expressed as a load duration curve in the submittal. In addition, table 7 in the TMDL outlines the LA at each decade of flow exceedance, as an example, at the 50th percentile of flow the LA is 1.6 tons/day.

Margin of Safety

Submittal describes explicit and/or implicit MOS for each pollutant [40 CFR § 130.7(c)(1)]. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided. If this is a phase II TMDL any differences in MOS will be documented in this section.

The MOS is implicit in that multiple biotic indices are used to asses the attainment of the impaired aquatic life use.

Seasonal Variation and Critical Conditions

Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s) [40 CFR § 130.7(c)(1)]. Critical conditions are factors such as flow or temperature which may lead to the excursion of WQS. If this is a phase II TMDL any differences in conditions will be documented in this section.

Seasonal variation and critical conditions are accounted for by the use of a load duration curve. The curve applies over all flows and hence across all seasons and periods of critical flow.

Public Participation

Submittal describes required public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s) [40 CFR § 130.7(c)(1)(ii)].

Public meetings addressing TMDLs in this basin have been held since 2001. KDHE also maintains a web site where all TMDLs, both draft and approved, are available to the public. This TMDL was available from June 2007 through August 2007. A public hearing on the basin TMDLs was held on May 30, 2007 in Hiawatha.

The Basin Advisory Committee held meetings to discuss the basin TMDLs on June 26, 2006, December 1, 2006, March 16, 2007, and May 14, 2007.

One comment was received from EPA during the public notice period and one during the final review period. The revised submittal has addressed both comments in a satisfactory manner. The second comment resulted in the revised submittal received by EPA on October 26, 2007.

Monitoring Plan for TMDL(s) Under Phased Approach

The TMDL identifies a monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used) [40 CFR § 130.7].

KDHE will continue to collect seasonal biological samples from the Wolf River site. Monitoring of sediment or solids will be expected in reissued National Pollution Discharge Elimination System permits.

Additional targeted sampling is identified as a need to address subwatershed priorities.

Scheduled evaluation of implementation practices for nonpoint source loading for this water body will be made in 2012. Wolf River will be re-evaluated for delisting on the 2016 303(d) list.

EPA agrees the submittal has sufficiently addressed monitoring and adaptive management.

Reasonable Assurance

Reasonable assurance only applies when less stringent WLAs are assigned based on the assumption of nonpoint source reductions in the LA will be met [40 CFR § 130.2(i)]. This section can also contain statements made by the state concerning the state's authority to control pollutant loads.

Reasonable assurances are not required as LAs are not being decreased to account for less stringent WLAs. Though not required, the submittal does identify state authorities and funding sources for implementing the TMDL.